## REMARKS

Claims 1-4, 6-13, 15 and 17-22 were pending in the application. Claims 18 and 21 stand objected to. Claims 1-4, 6-13, 15, 17, 19-20, and 22 stand rejected. Claims 1, 11-12, 18-19, and 21 were amended. Claims 23-24 were added. Claims 1-4, 6-13, 15, and 17-24 remain in the application.

The specification was objected to and has been amended as suggested.

Claims 18 and 21 stand objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 18 and 21 have been so rewritten.

Claims 1-3, 6-7, 13, 15, 17, 19-20, and 22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (U.S. Patent No. 6,249,616; hereafter Hashimoto '616) in view of Hashimoto et al. (U.S. Patent No. 6,249,317; hereafter Hashimoto '317) and further in view of Toyoda et al. (US Patent No. 5,461,440; hereafter Toyoda). Claims 4 and 8-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '616 in view of Hashimoto '317 and further in view of Toyoda and "Reference Input/Output Medium Metric RGB Color Encodings". Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '616 in view of Hashimoto '317 and further in view of Toyoda and Inoue et al. (US Patent # 5,083,209). Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '616 in view of Hashimoto '317 and further in view of Toyada and Hirai et al. (US Patent # 6,603,928). The rejection of Claim 1 stated:

> "In regard to claim 1, note Hashimoto '616 discloses the use of a method for producing a composite digital image, comprising the steps of providing a plurality of partially overlapping source digital images having pixel values that are linearly or logarithmically related to scene intensity, wherein the source images have overlap regions wherein pixels of the images correspond in scene content and differing in scene content outside said overlap regions (column 4, lines 6-21 and figure 3-4), computing a radial exposure transform to compensate for exposure fall off as a function of the distance of a pixel from the center of the digital image (column 6, lines 52-60; the images are compensated for vignetting using a computed transform), modifying the source digital images by applying a radial exposure transform to one or more of the source digital images to produce adjusted source digital images (column 6, lines 52-60; the images are compensated for vignetting using a computed transform), and

combining the adjusted source digital images to form a composite digital image by blending said overlap regions (column 6, lines 26-35; the two images are normalized in order to blend them).

"Therefore, it can be seen that Hashimoto '616 fails to disclose that the step of determining the focal length of the source digital images based upon one or more sets of corresponding pixel values of the source digital images and using the determined focal length to calculate the radial transform.

"In analogous art, Hashimoto '317 discloses the use of an automatic exposure control apparatus. Hashimoto '317 discloses the use of an image signal to determine focal length of an image (column 10, lines 30-49; the auto-focus routine determines the focal length based on the image signal). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary reference to include the calculation of the focal length of an image based on the image signal as suggested by Hashimoto `317, in order to reduce the sized of the video camera by eliminating the need for extra sensors (column 10, lines 15-20).

"Also in analogous art, Toyoda discloses the use of an image correction system. Toyoda discloses the use of the focal length to determine the radial transform for the correction of exposure falloff (column 1, lines 49-52, the marginal attenuation is considered exposure falloff; column 10, line 17-column 11, line 55; the focal length is used to compensate for marginal attenuation in the image). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to use focal length to determine the radial transform for correction of exposure falloff, as suggested by Toyoda, in order to edit the image without the use of heavy / large lens systems (column 1, lines 62-62)."

Claim 1 states:

1. A method for producing a composite digital image, comprising the steps of:

providing a plurality of partially overlapping source digital images having pixel values that are linearly or logarithmically related to scene intensity, said source digital images having overlap regions wherein pixels of said source digital images correspond in scene content, said source digital images differing in scene content outside said overlap regions;

determining the focal length of the source digital images from one or more sets of corresponding pixel values of the source digital images in said overlap regions;

computing from the determined focal length, a radial exposure transform to compensate for exposure fall off as a function of the distance of a pixel from the center of the digital image;

modifying the source digital images by applying the radial exposure transform to one or more of the source digital images to produce adjusted source digital images; and

combining the adjusted source digital images to form a composite digital image by blending said overlap regions.

Claim 1 is supported by the application as filed, notably the original claims and at page 9, lines 1-10.

The rejection notes that Hashimoto '616 fails to disclose the determining step of Claim 1 and cites Hashimoto '317 and Toyoda et al. in relation to the determining step of Claim 1.

The rejection states that Hashimoto '317 discloses the use of an image signal to determine focal length of an image. Claim 1 requires determining the focal length of source digital images having overlap regions wherein pixels of the source digital images correspond in scene content, the source digital images differing in scene content outside the overlap regions. Claim 1 also requires that the source digital images are later modified and combined to form a composite digital image and that the focal length is determined from one or more sets of corresponding pixel values of the source digital images in the overlap regions. This is unlike Hashimoto '317, in which the focal length is determined from a lens position. Hashimoto '317 moves a lens while capturing multiple images, and receives focal length information from a lens driving portion. ("Lens movement amount Focal length" in FIG. 12A of Hashimoto '317) Hashimoto '317 captures differently focused images of the same scene, while receiving this focal length information and then selects one of the focal lengths corresponding to an in-focus image:

"The center of an image plane 28 shown in FIG. 15 is set as an AF area 29, and the data within the area 29 are integrated by a digital integration circuit 26." (Hashimoto, col. 10, lines 26-28)

"FIG. 13 is a flow chart of an AF control operation (AF routine (1)) executed by the control microcomputer 21. When the routine is called, first, the process waits until an AF evaluation value obtained based on the output data of the digital integration circuit 26 becomes stable at step #5. Then, the lens 1 (a focusing one in this case) is moved (step #10), and whether or not the AF evaluation value has increased due to the lens movement is determined (step #15). When the AF evaluation value has increased, the process proceeds to step #25, where the lens 1 is moved until the AF evaluation value decreases. When the AF evaluation value starts to decrease, the lens 1 is returned to an in-focus position at step #30, and the lens 1 is stopped at step #35." (Hashimoto, col. 10, lines 36-49)

Hashimoto '317 is also unlike Claim 1, in that Claim 1 requires that the source digital images have overlap regions, in which pixels of the source digital images correspond in scene content, and that the source digital images differ in scene content outside the overlap regions. The "image signal" is a video signal (Hashimoto '317, col. ten, lines 14-20). The video signal has multiple images and the lens is focused at different distances in the different images of the video signal (See Hashimoto '317, Figures 13-14 and col. 10, lines 39-49). Each of those different images includes the same scene. (Hashimoto '317, Figure 15) The autofocusing operation of Hashimoto '317 is dependent upon a central autofocus area 29 remaining the same, since the lens has to move beyond an in-focus position and then back to the same in-focus position. (Hashimoto, col. 10, lines 41-49; also see Figures 14-15)

A combination of Hashimoto '616 with Hashimoto '317 would, assuming for the sake of argument that such a combination were possible, apply the autofocusing method of Hashimoto '317 to each of the images of Hashimoto '616. Each autofocus operation would use autofocus evaluation values from a respective central area (reference numeral 29, in Hashimoto '317) of the images of the respective video signal. How would this meet the language of Claim 1: "determining the focal length of the source digital images from one or more sets of corresponding pixel values of the source digital images in said overlap regions"?

It is also proposed in the rejection that:

"it would have been obvious to one of ordinary skill in the art to modify the primary reference to include the calculation of the focal length of an image based

on the image signal as suggested by Hashimoto '317, in order to reduce the sized of the video camera by eliminating the need for extra sensors".

Hashimoto '616 does not teach the use of the video camera having quotation marks extra sensors close quotation marks. Hashimoto '616 is directed to a quotation marks computer-implemented method close quotation marks. (Hashimoto '616, col. 1, lines 58-59) The motivation presented supports a combination of Hashimoto '317 with itself, rather than Hashimoto '616. The proposed combination also fails to address why one of skill in the art would require use of a video camera and a multiple image, multiple-focus distance routine rather than a simplification taught in Hashimoto '616: the use of a single focal length lens for multiple images. Hashimoto '616 states:

> "The invention produces a solution that is always physically realizable, and because the dimensionality of the problem is reduced, a solution may be obtained more quickly. Further, because the parameters may be chosen to be directly related to how the images are acquired, solving for the parameters is readily simplified by further reducing the number of degrees of freedom if there are known constraints on the image acquisition, such as using a single focal length lens for multiple images or restricting motion (such as if the images are all acquired using a camera mounted on a tripod and allowing only panning)." (Hashimoto '616, col. 2, lines 34-44)

Hashimoto '616 does not need the extra sensors discussed in the rejection. Hashimoto '616 already teaches a solution that eliminates that need and provides an additional benefit of simplification. The rejection has not presented motivation that would overcome this teaching.

The rejection also cites Toyoda, but Toyoda does not add to the teachings of Hashimoto '616 and Hashimoto '317 in relation to the matters discussed above. Toyoda et at. does not use source digital images in determining focal length. In Toyoda et al., focal length is determined during capture of film images:

> "Lens information (focal length, focal position, and aperture value) in a photographic operation is determined by the CPU 102 (step S7)). The lens information is converted into marginal attenuation data by using data in the ROM 105 incorporated in the lens (step S8)." (Toyoda et al., col. 10, lines 17-23; Figures 11-13)

In Toyoda et al., at the time that focal length is determined and the lens information including the focal length is converted into marginal attenuation data, source digital

images do not exist. Captured images are on film, which is later scanned. (See Toyoda et al., Figure 11 and col. ten, lines 24-32) This is like Hashimoto '317, in that both references determine focal length at the time of image capture and are dependent upon camera features for that determination. Hashimoto '317, as noted above, moves a lens while capturing multiple images, and receives focal length information from a lens driving portion. ("Lens movement amount Focal length" in FIG. 12A of Hashimoto '317)

Toyoda alone or in combination with Hoshimoto '616 and Hoshimoto '317 does not disclose determining the focal length of source digital images using corresponding pixel values of the source digital images in overlap regions, as required by Claim 1.

Claims 2-4, 6-13, 15, 17, and 22 are allowable as depending from Claim 1.

Claim 19 is supported and allowable on the same grounds as Claim 1. Claim 20 is allowable as depending from Claim 19.

Added Claim 23 states:

> 23. A method for producing a composite digital image, comprising the steps of:
>
> providing a plurality of partially overlapping source digital images, each said source digital image having an array of pixels, said pixels having values that are linearly or logarithmically related to scene intensity, said source digital images having overlap regions wherein pixels of said source digital images correspond in scene content, said source digital images differing in scene content outside said overlap regions;
>
> determining the focal length of the source digital images from one or more sets of corresponding pixel values of the source digital images in said overlap regions;
>
> computing from the determined focal length, a radial exposure transform to compensate for exposure fall off as a function of the distance of a pixel from the center of the digital image;
>
> modifying the source digital images by applying the radial exposure transform and a linear exposure transform to said pixels of one or more of the source digital images to produce adjusted source digital images; and

combining the adjusted source digital images to form a composite digital image by blending said overlap regions.

The language of Claim 23 is supported by the application is filed, notably the original claims, particularly claim 2 and at page 6, lines 1-4.

Claim 23 requires providing a plurality of partially overlapping source digital images, each having an array of pixels and also requires modifying the source digital images by applying the the radial exposure transform and a linear exposure transform to said pixels of one or more of the source digital images to reduce adjusted source digital images. The portion of Hashimoto cited in relation to Claim 2, does not meet this language. Hashimoto states:

> "Another correction operation normalizes the brightness in the source images to be combined. Source images may differ in brightness level. This may result, for example, if images are captured with autoexposure camera settings. One simple approach to normalize the brightness determines the average color data for pixels of the overlapping region in a source image and normalizes the color data values $A_{ij}$ for each pixel (I, j) in that region to the calculated average,
>
> $$A_{ij}^{*} = \frac{A_{ij}}{\overline{A}}.$$
>
> A more sophisticated procedure may use a model that accounts for nonlinearities in mapping brightness to data values, and for differences resulting from different device types (for example, CCD and film) used in acquiring the source images, as well as differences among devices of the same type." (Hashimoto, col. 6, lines 25-43)

Two transforms are disclosed here. One of the two transforms uses average color data and is limited to the overlapping region in the source image and the other transform is nonlinear. Both are unlike Claim 23. A combination of Hashimoto with Toyoda et al. does not change this.

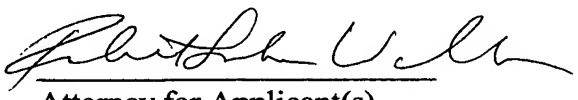
Added Claim 24 is supported and allowable on the same grounds as Claim 23.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney

would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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